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ABSTRACT

An ongoing study examined implementation and student response to academic career magnet (ACM) programs in New York City high schools. The programs emphasize both college preparation and career education, demonstrating one approach to the current emphasis on integrating academic and vocational education. New York City offers a wide array of magnet programs (282 in 7 categories); however, only one-fourth to one-half of applicants receive their first choice of program. In 1988, one-half selected academic programs, one-tenth vocational, three-tenths academic career magnets, and one-tenth special education/bilingual. A telephone survey of 61 ACM administrators identified 6 program characteristics: (1) ACMs are isolated from the rest of the school; (2) they focus heavily on career preparation; (3) they use internships; (4) they have a graduate placement program; (5) faculty have experience in the career field; and (6) they strongly emphasize career counseling. Only a small fraction are able to place one-fifth of their graduates in jobs. Some programs (such as law, humanities, and medical) are less successful in integrating academic and career education than others (such as business, math, science, and engineering). Students with low reading achievement prefer programs with high placement rates and computer usage. Academic rather than career-oriented magnets are in high demand among students of all reading levels, far exceeding supply. In order for vocational and academic integration to occur in a set of new career-oriented academic programs, several conditions must be met: (1) school systems must be able to create magnet schools systemwide; (2) school systems must be able to create magnet schools that have a focus on the integration of vocational and academic work; (3) these vocational and academic magnets must be successfully implemented; and (4) students must be encouraged to choose schools based on their career interests. (The report includes 30 references and the questionnaire.) (CML)

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National Center for Research in Vocational Education

University of California, Berkeley

ACADEMIC-CAREER INTEGRATION IN MAGNET HIGH SCHOOLS: ASSESSING THE LEVEL OF IMPLEMENTATION

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PREFACE

This is the third report of an ongoing study of academic career magnets in New York City. The first report, *The Effectiveness of New York City's Career Magnet Schools: An Evaluation of Ninth Grade Performance Using an Experimental Design* by R. L. Crain, A. L. Heebner, Y. P. Si, W. J. Jordon, and D. R. Kiefer, looked at the admission process and the ninth-grade outcomes of students, using the lottery admission system as a randomized experimental design. The second report *Career Magnets: Interviews with Students and Staff* by A. L. Heebner, R. L. Crain, D. R. Kiefer, Y. P. Si, W. J. Jordan, and B. Tokarska, is an ethnographic analysis of interviews with students and faculty in four career magnet schools. Additional reports on the effects of the career magnets are planned for the future, subject to funding availability.

EXECUTIVE SUMMARY

This report examines the degree to which one city has been able to create programs with a dual emphasis on college preparation and career education, which we call "academic career magnets," and the degree to which the students have responded to the opportunity of attending such schools.

The city, New York, is in many ways an ideal site for a test of the feasibility of these types of programs. The city has a long history of creating magnet programs, and in 1988 had 443 separate high school programs. Many of these programs are explicitly described as dual purpose—offering both academic and career training. The school system has also created an application system designed to permit as many high school students as possible to apply to magnets and a lottery admission process for many of the dual purpose programs. The result is a system in which eighty-one percent of students apply to magnet schools.

In 1988, the demand was greatest for traditional academic programs in mathematics, science, and engineering. Magnet school applicants chose programs as follows:

- one-half selected *academic programs*
- one-tenth *vocational programs*
- three-tenths *academic career magnets*
- one-tenth *special education and bilingual programs*

Among the career-oriented academic programs, business was the most popular, followed by medical careers, fashion and the arts, and law/criminal justice, in that order. Vocational school applications were greater than the number of applications in business.

Despite opening large numbers of programs, there are serious shortages in nearly all career-oriented programs, especially in math/science/engineering careers, law and criminal justice, technical trades, and humanities programs.

Four-fifths of the academic career magnets have committed themselves to providing a career-oriented curriculum but not all have done so. Only one-tenth of the schools have a large program of job placement for graduates. However, one-third have a number of

students interning, one-quarter have counselors especially for career advising, one-half have faculty with experience in the career field, and most have a variety of activities to facilitate the school-to-work transition.

Most of the academic career magnets have developed a special curriculum. Two-thirds separate their students from other students in the school building for a large part of the day. One-half have high computer usage; one-third have other forms of equipment for students; and nearly half involve a large number of students in team projects.

Program administrators say that the most important aspect of their program is either their career emphasis or their ability to create a good interpersonal climate. Asked what their program needs most, they said more of the same: more career-oriented teaching and improvements in the curriculum, usually to permit more career education.

Programs which prepared students for different careers often seemed to have marked differences in curricula. For example, business programs made very heavy use of computers, while medical career programs used them very little. Math, science, and engineering programs stressed career education more than most programs and wanted to do even more in this area. Humanities programs placed great emphasis on counseling. Further evidence for differences in schools shows up in the correlational analysis of program characteristics which reveals two distinct types of programs: one type emphasized computers, career counseling, and a balanced emphasis on both college preparation and job placement for graduates. On the other hand, a different style, apparently intended for students with weaker academic backgrounds, emphasizes student involvement, career education, cooperative learning, and job placement. These differences all suggest that New York's strategy of decentralized planning is sensible, as these programs apparently cannot function with identical educational strategies. It does appear that all programs have a low number of counselors.

Students with high and low reading test scores choose programs which differ in curriculum and educational emphasis. Students with low scores show a preference for programs with high numbers of postgraduate job placements and for programs which emphasize computer usage.

The study has also demonstrated that there is a great deal of student demand for magnet schools—far exceeding the supply. About half of that interest is in attending academic magnets, rather than vocational or academic career programs, and this is true even for students with poor reading scores. However, the New York City program is young and demand for career-oriented magnets may increase as the programs become better known, especially if the supply of such programs increases. It is also reassuring that students are not taking advantage of the choice system to avoid academically demanding programs. For example, the arts programs with modest academic components are not very popular.

The evidence of this analysis suggests that it is possible for a school district to create a large number of diverse magnet programs and to build demand for them. It is more difficult to create programs which integrate college preparation with career education. Even so, after a little more than a decade of effort, two-fifths of the magnets in New York City have a stated intention of presenting academics and career training in the same setting, and perhaps one-half of these are at least moderately successful. Given the difficulties of innovating in secondary schools, this seems a good beginning.

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INTRODUCTION

One of the most important reforms for American secondary schools being discussed today is the integration of vocational and academic instruction. According to advocates, the goal is that high school graduates would have career-oriented training along with academic teaching that would be contextualized by combining it with training in real-world work. Critics have argued that it would be difficult, perhaps impossible, to change American high schools and American high school students to make this integration possible. New York City has been embarked on a ten-year long experiment in this integration involving tens of thousands of students in scores of programs. New York City thus provides a test case to determine whether schools will willingly convert from the traditional comprehensive school curriculum to an integration of vocational and academic work, and, if they do, whether this is beneficial to students.

Why Academic-Career Integration Is on the Public Agenda

At the turn of the century, high schools were highly academic institutions. Serving only about a tenth of the teenage population, they were mainly a place where middle-class men and women got a formal education, usually heavily slanted toward academic classics. As organized labor began to press to remove children from the factories, alternative forms of high schools were devised—first the vocational school intended to provide training in the crafts, and then the comprehensive school, an academic school where some students could take vocational courses while others were being prepared for college. Still others were in the limbo of the so-called "general" curriculum.

Between the first World War and the 1960s, the nation was saturated with huge brick high schools, often the grandest architectural achievements in their community, and the vast majority of students stayed in school to at least enter high school, if not graduate. By the 1960s, the national goal had become to graduate as many American students as possible, and the term "drop out" was coined to describe students who did not live up to this ideal.

The reforms that occurred in the last thirty years have been in large measure a response to the fact that nearly everyone attends high school now. From one side is the

demand that schools be made more rigorous, so that the addition of millions of less well-prepared students does not water down the academics of a high school. The opposing pressure is to make the high school curriculum more relevant, a demand originally made by the student protesters in the 1960s who were looking ahead to being conscripted into fighting a war they did not understand and wanted to know why they should spend their years of freedom learning classics. Now a somewhat similar demand comes from a very different source as corporation executives and economic planners worry about how students can be prepared for employment.

The issue has been both simplified and made more complicated by the invention of "choice" as a new reform strategy. Choice entered the modern education debate as the voucher concept of the 1960s, designed to improve the quality of education for poor and minority students. It is now more often advocated by conservatives as a way to break the government bureaucracy's monopoly on schooling. In between it has advocates with a variety of other rationales for their position.

Choice simplifies the debate over excellence versus relevance because it allows for the possibility that not every school will have to meet every demand placed upon it—students can choose which schools to attend to serve the particular needs they have. Yet choice has also made the debate more complex by introducing a new source of potential inequity.

Choice is hardly a new idea in American education. Boston Latin School was a choice school, serving the entire city of Boston. Indeed, simply attending high school at all was a matter of choice until the end of the Second World War. Similarly, the term "magnet school" is a recently coined label, but magnet schools have been around since the origin of public education. In this report we will use what we consider the most encompassing definition of a "magnet school": that it is a school which competes with other schools for students, even though those students may live closer to another school. If students from distant neighborhoods come, by definition the school must have some special characteristic which makes it sufficiently attractive to students to offset the additional distance they must travel. Similarly, we will define a "choice plan" as any school assignment formula which allows students to choose their school. New York City has had a choice plan for a century. What is new in the recent discussion of magnet schools and choice is that magnet schools are no longer limited to schools for the gifted, the vocationally bound, or the handicapped,

and choice is being proposed not merely for these three minority categories of students—the very bright, the vocationally oriented, and those requiring special teaching—but for the large mass of typical students as well.

The American high school system has always offered students choices, but in the past, those were choices that most students did not use. In the first American choice plans, students could choose in the style of European schools, between an academic education and an education preparing them for the trades. In fact, very few American students wanted to give up the dream of going to college, so most students went to academic schools which, filled with so many students who were not going to go to college, began referring to themselves as comprehensive schools. While these schools offered both vocational and academic training, to some degree the students might as well have been in two different buildings since the academic students were taking advanced academic courses and receiving no hands-on career training and the vocational students were getting watered down academic courses. Many students attempted to make the best of both worlds by taking college preparatory courses and using their electives to take vocational classes, but as a consequence received only a casual education in any real-world career. As a solution to a collection of problems, a new version of choice has been developed which is the opportunity to choose not between vocational and academic programs, but studying academics and career education together in one career area versus another. A simple example is the performing music magnet school which prepares students simultaneously to be musicians and to attend college. This idea has now been expanding in a variety of other fields. There is no commonly agreed upon name for magnet schools which integrate vocational and academic education around a particular career focus, but they share some features with programs known as "academies" (Stern, Raby, & Dayton, 1992). In this report we have not committed ourselves to any particular name for them. In our previous reports, we referred to these kinds of schools as career magnets, but a slightly more accurate title is "academic career magnet" and that is what we will be using in this report.

New York City as a Test Site

While the idea of integrating vocational training and academics in career magnets may seem reasonable, there are questions about its feasibility. First, can and will public schools create such institutions on a large scale? Second, how many students have an interest in attending these kinds of schools? New York City is an interesting site at which to examine these two questions because New York City has for many years freely allowed magnet programs to be created. The programs are developed with relatively little central administration control. At present, there are over two-hundred high school magnet programs and even if the central administration wished to control their content it would be difficult to do so given the number of programs involved. Many of these programs are traditional vocational programs; many others are traditional academic programs. In between are some integrated career programs which could, if they wished, offer an integration of vocational and academic education around a particular career. On the other hand, there is relatively little pressure from the central administration for them to do so. The question then is, in this more or less free market, will integrated programs survive?

It may be helpful to give a quick history of the New York City high schools in the last century. First, New York City, like other cities in the northeast, has had a long tradition of magnet schools beginning with the early schools which are the ancestors of the schools for extraordinary students such as Stuyvesant, Brooklyn Technical, the Bronx High School of Science, and the school that everyone in the seventies knew as the star of a television show called *Fame*: the LaGuardia High School for the Arts. At the same time, New York City, again like the rest of the northeast, led the way in creating vocational schools.

Finally, in the last few decades, New York City has created a collection of alternative schools for students having difficulty in regular high schools. Sometime during the 1980s the school district began encouraging a new group of magnet schools which were neither traditionally vocational nor traditionally academic but rather some hybrid of the two. Originally, these were freestanding schools. They usually came about as a result of what New York City calls "redesign" and might in other places be called zero-based planning. Some high schools had earned reputations as failures with few students wanting to attend them, a history of violence, or, in some cases, few white students wanting to attend them. In those situations, the school board would sometimes simply close the

school, remove all the students, faculty, and the principal and start over from scratch with a new design team which would participate in the selection of a new principal who would then select a new staff and set up criteria by which students could come to the school. The school received more than the usual allotment of funds, but only for the first five years, at which time it was assumed that the redesign was complete. The school was put on the same financial footing as other schools. The new magnet schools were "theme" schools, and, in most cases, the theme consisted of a career field such as prelaw, business, computer science, or in some cases, an academic/precollegiate curriculum such as science training aimed toward medical careers. In all cases, the school was a college preparatory school. In most of the cases, the school was also focused on preparing students for entry-level jobs in some career field.

The new schools attracted some attention and entered a competition for good students. The comprehensive schools fought back. They asked for and got the opportunity to create schools-within-a-school modeled on the same approach as the redesigned high schools.

Thus, the student interested in escaping his neighborhood high school or interested in attending a program focused on business could previously have applied to the established magnet school, such as the Murray Bergtraum High School for Business Careers, but now could also apply to a score of prebusiness programs which were located in comprehensive high schools throughout the city.

Students choosing New York high schools have a very wide range of choices in front of them—vocational programs, academic programs, alternative schools, traditional comprehensive high schools, and the new academic career magnets. It is interesting that New York officially has not altered its terminology to accommodate the new types of magnet programs. New York officially classifies its schools into four categories: vocational; specialized, meaning the four highly selective academic and arts schools; academic-comprehensive schools; and alternative schools. It also has programs for special education students and programs which use bilingual teaching. While it does not have an official category for academic career magnets, it defines many of the new programs as "education options": "three to four year career programs that prepare students for entry-level jobs, as well as higher education" (New York City Board of Education, 1987, p. 409).

In relation to the creation of the new magnet schools, key political actors in the city became concerned about the issues of equity. Their first victory was to force many of the magnet schools in the city, including the newly created academic career schools, to accept students of all reading levels. The second was to permit the career magnet schools to select only fifty percent of their students, still using quotas for students with low, medium, and high reading scores; the other half would be assigned randomly from among all applicants, again, with the same quotas. The only exception to the quota rule was a give-back to the highest-scoring one-fiftieth, in the tradition of creating elite schools for the most gifted students. The top two percent in reading scores were given their first choice of schools whenever possible.

The widespread use of a lottery system with quotas requiring schools and programs to accept their share of students from lower reading groups has been controversial, although the controversy is not as great as one might expect given the important issues of race, class, and educational equality in all American cities. The new high school programs have been attacked from the left because, until the late 1980s, an effort was made to limit minority enrollments in a small number of high schools in order to maintain some schools which were racially balanced in a city which has an increasingly large minority enrollment. More recently, the schools have been attacked from the right, accusing the system of offering poorly educated minority students too many seats in the magnet schools and harming the education of white and minority students of talent.[1]

In this situation, how many students would choose career magnets? What kinds of magnets will they choose? In this report, we examine four questions about the New York City high school system:

1. What sorts of magnet programs have been created by the New York city schools? In particular, how many New York City magnets claim to attempt an integration of vocational and academic education?

2. What sorts of magnets are New York City students interested in? In particular, how many are interested in magnet high school programs which have integrated

[1] The argument at the high school level might be more bitter were it not for the fact that the controversy over the admission policies of the City University of New York has been more exciting and has served as a diversion to draw off much of the controversy from the secondary schools.

vocational and academic education? More particularly, do students with different levels of reading achievement differ in their interest in academic-career integration?

3. Among those programs which are attempting to integrate vocational and academic education, how well are they succeeding? Do different types of programs achieve different levels of integration?

4. When students select programs, do they choose those programs which provide the greatest amount of integration of vocational and academic training? In particular, do students with different levels of reading performance differ in their tendency to choose programs with high levels of integration?

The first two questions will be answered using school district records. To answer the last two questions, we conducted a survey of the administrators of sixty-one of the new magnets which are intended to have an academic-career focus.

In the next section of this report "The Big Picture in New York City: The Supply of All Magnet Programs and the Demands of Students," we will look at the number of different types of magnets that exist now in New York City. We believe that to some considerable degree, the number of magnets of various types that exist indicate what kinds of magnets can be created and what kinds of magnets school faculty and administrators prefer creating. (Of course, there are a number of other factors influencing the creation of new magnets as well.)

New York City has a centralized computer-based high school admissions process which allows us to count up the number of students who applied to different kinds of magnet programs. This allows us to compare the information on the supply of programs in New York City with the demand for programs of different types. The magnet schools have been grouped into seven types which, for lack of a better word, we will call majors. That section also looks at the extent to which demand for particular majors varies among students of average reading achievement, compared to the choices of students with high reading achievement and students with low reading achievement.

In the third section, "Characteristics of New York City Academic Career Magnets: Survey Results," we will focus on a group of sixty-one high school magnet programs which are part of a group of programs commissioned to provide academic career-oriented

training in various fields. A survey of the sixty-one program administrators asked them to describe the instructional emphasis of their school (i.e., the balance between traditional academic teaching and an emphasis on student-initiated and career-directed work). In this section, we discuss the question, "How much work has been done to integrate vocational and academic training in these programs?" The section also answers two other questions: first, "Do schools with different majors do different levels of vocational and academic preparation?" Secondly, "Do students of different reading achievement levels tend to choose programs which differ in their degree of vocational and academic preparation?"

The last section is the conclusion. The appendix contains the questionnaire used in the study of the characteristics of the sixty-one programs.

THE BIG PICTURE IN NEW YORK CITY: THE SUPPLY OF ALL MAGNET PROGRAMS AND THE DEMANDS OF STUDENTS

In looking at New York City's array of magnet programs, the first question we ask is "What is the supply?" How many and what kinds of programs are available for students to choose from? The second question is, "What is the demand?" How many eighth graders apply to which programs?

The Wide Array of Programs Supplied

New York City has seventy-seven comprehensive high schools which serve specific attendance zones (New York City Board of Education, 1987).[2] Students can choose not to attend their neighborhood high school's comprehensive program, and to instead apply to one of 282 magnet programs[3] located in zoned schools or in thirty-nine other high schools which do not serve specific attendance areas. The New York City Schools classify the 282 programs being offered into seven categories, which we call "majors." These are technical trades; business; humanities; law; math, science, and

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[2] This data is for the school year 1988-1989, the year in which the students being studied in other portions of this project entered the ninth grade of high school. The number of schools and programs is slightly different in other years, but at this writing the school offerings have not changed greatly from what is described.

[3] This excludes 166 programs for bilingual or special education instruction.

engineering; medical; and fashion, performing arts, and graphic arts. As Table 1 shows, within any major category, New York City eighth graders have a wide variety of choices available to them.[4]

Table 1

Supply of Programs Offered by Major Program Category

Major	Number of Programs
1. Law and Criminal Justice	11
2. Technical Trades	54
3. Business	36
4. Humanities	48
5. Math, Science, and Engineering	54 (+3)
6. Health and Medical Careers	32
7. Fashion, Perf. Arts, and Graphic Arts	39 (+5)
Total	274 (+8)*

*Note: The additional programs in categories 5 and 7 represent the programs at Bronx Science, Stuyvesant, Brooklyn Technical, and the five programs at LaGuardia High School which use a different application system and are not part of the analysis.

The programs mentioned below show the breadth of magnet programs available in New York City. The following examples illustrate New York City's efforts to offer programs to meet many varied career and/or college aspirations that eighth graders, making their high school plans, might have.

Technical Trades Programs

In the technical trades major, the possible choices include such programs as aviation maintenance technology at Aviation High School in Queens, and flying, aviation electronics, aerospace design, meteorology, and aerospace medical technology at August Martin High School, also in Queens. For a more down-to-earth program, one may choose architectural drafting and design at High School of Art and Design in Manhattan. To make those buildings habitable, there are programs in cabinet making, oil burner and air

[4] The total in Table 1 is shown as 274 + 8, rather than as 282. The eight highly selective programs (housed in Bronx High School of Science, Stuyvesant High School, Brooklyn Technical High School, and Fiorella H. LaGuardia High School of Music and the Performing Arts) have a different admission system, and for this reason have been counted separately in the accounting of this table and the tables that follow.

conditioner service/installation, and plumbing at Thomas Edison Vocational-Technical High School. If the applicant is located on Staten Island, Curtis High School offers programs in technical drawing and blueprinting as well as electrical work, plumbing, masonry, and carpentry.

Business Programs

The second program major covers business. This includes such programs as accounting, computer programming, stenography, and word processing at Franklin D. Roosevelt High School in Brooklyn, or banking, finance, and secretarial studies at Harry S. Truman High School in the Bronx. In Manhattan, at Murray Bergtraum High School, there are, in addition, offerings such as securities and finance as well as marketing. If an applicant's interest runs more toward business law, there is a program for that student at A. Phillip Randolph High School.

Humanities Programs

Programs in the humanities include all of the basic academic subjects. If a traditional approach to basic academic subjects is what applicants want, they may apply to Townsand Harris High School in Queens. Here, curriculum focus is on the humanities, including literature, history, and language, with courses also offered in biology, the physical sciences, and mathematics. For applicants living in Manhattan, a similar educational approach can be found at the Charles Evans Hughes High School for the Humanities.

Law-Related Programs

If a program in law and criminal justice is what an eighth grader is looking for, Martin Luther King, Jr. High School in Manhattan will supply it, with its basic academic subjects molded around the theme of law and social justice. At Francis Lewis High School in Queens, students will have the opportunity to examine the social purposes and ethics of law. Also, at John Jay High School in Brooklyn, applicants can look forward to an examination of the nature of law in history and literature, as well as gaining exposure to various professions in the legal system.

Math, Science, and Engineering Programs

Math, science, and engineering comprise the fifth major. At Midwood High School in Brooklyn, an applicant will find these subjects taught around a core curriculum of medical science. This program includes courses in biomedical genetics, bacteriology, and organic chemistry, as well as introductory engineering and computer programming. At Staten Island Technical High School, the emphasis is on engineering, science, and computer science. While at Benjamin Cardozo High School in Queens, an applicant interested in advanced science and mathematics courses will find a home.

Medical Careers Programs

The sixth major of magnet programs encompasses those programs which offer training for a medical career. For example, Dewitt Clinton High School in the Bronx has a program which allows students to specialize in such areas as medical laboratory assistance and nursing assistance. In Queens, at John Adams High School, the program in this category offers an interesting twist. While the emphasis is on sports medicine, applicants interested in anything from sports statistics to sports journalism, and from coaching to the economics of sports, will find something of interest.

Fashion and Performing/Graphic Arts Programs

Fashion joins with the performing and graphic arts to comprise the seventh major. At Bayside High School in Queens, there is a program offering courses in design, drawing, illustration, fashion, photography, sculpture, and cartooning. In addition, there is another program at this school providing courses in music such as vocal instrumentation and orchestral performing. In Manhattan, at the High School of Fashion Industries, there are at least five programs offering courses ranging from computer graphics and fashion illustration, to textile weaving and computer textile design. There are also programs in jewelry design, theatrical costume design, and a colorful range of others, from fashion buying to microeconomics and business law.

Students' Demands in the High School Application Process

Now we turn to our second question: What is the demand? In 1988, our base year, there were more than sixty-thousand eighth graders in the city of New York who applied for admission to a public high school. To simplify our analysis, we selected only the approximately forty-nine thousand who were in public middle schools or junior high schools, were not applying late, did not require or apply to special education classes or classes in a language other than English, and did not score in the top two percent on their qualifying reading exam.

Nineteen percent of the forty-nine thousand students (approximately 10,000) specified that they were not interested in any magnet programs, and we will omit them from the analysis. This left 39,041 eighth graders who applied to the New York City magnet programs.

On their application students were asked if they wished to apply to any or all of the eight highly selective "specialized" programs housed in Bronx High School of Science, Stuyvesant High School, Brooklyn Technical High School, and the Fiorella H. LaGuardia High School of Music and the Performing Arts. These four schools admit students by school selection only and are so highly desirable that a separate selection process has been created for them. Nearly half of the students in New York City applied to at least one of these programs, for example, 15,852 to Stuyvesant and 2,606 to the fine arts program at LaGuardia. After students have indicated whether they wish to apply to these eight programs, they may apply to eight other programs, ranking them in order of preference, and are told that they are more likely to be admitted to their first choice. The eight highly selective programs are thus never counted as a student's first choice.

Table 2 shows how the 39,041 students distributed their first choices among the seven program categories. One of the first things we notice in this table is that half of New York City's public school eighth graders made their first choice a program in one of the two most academically-oriented areas (e.g., humanities and math/science, and half applied to career-oriented programs. However, programs in the humanities and mathematics/ science) categories make up only thirty-eight of all the magnet programs. The supply of New York City's popular magnet programs does not satisfy the demands of the students entering high school.

Table 2

Supply of and Demand for Programs by Major Program Category

Major	# of Seats	# of 1st Choice Applications	Ratio of Seats to Applications
Law and Criminal Justice	606	2,035	.30
Technical Trades	2,706	4,736	.57
Business	2,905	3,680	.79
Humanities	5,785	9,747	.59
Math, Science, and Engineering	5,815	13,184	.44
Medical and Health Careers	2,153	3,142	.69
Fashion, Perf. Arts, and Graphic Arts	2,399	2,517	.95
Total	22,369	39,041	.57

The Demand/Supply Ratio

Given the wide variety of magnet programs available in New York City, one might conclude that a suitable situation exists somewhere for almost every student. On the contrary, an earlier report (Crain, Heebner, Si, Jordan, & Kiefer, 1992) showed that for most majors only one-fourth to one-half of the applicants received their first choice, and once the vocational programs are excluded, one-third of the applicants receive no offers, or decline their offers, and attend the comprehensive program in their attendance zone. This problem brings us back to a question of equity which "choice" critics raise—if the choices available are not sufficient to satisfy *all* public school students, then those students whose choices are not granted may very well suffer educationally. Earlier reports on the academic career magnets by Crain et al. (1992) and Heebner et al. (1992) substantiate the concern of the choice critics by demonstrating the benefits gained by students who win admission to these magnets over those students whose choice of schools is denied. This is not to deny that New York City schools offer an impressive variety of programs, but it does alert us to the reality of the students' unmet needs.

Choice of Major Program Category by Reading Achievement

Because demand, as we have seen, varies greatly from one major category of programs to another, and since admission to various magnet programs is based on student reading achievement, we decided to see what the general reading achievement was of students applying to the various major categories of programs. However, before looking at that data, it might be informative to see how many students there are in each reading achievement group. As Table 3 shows, in 1988, of 37,458 eighth graders, there were 8,140 who scored above grade level on their standardized reading exam. Almost half of the students, or 20,307, scored at grade level. The remaining 9,011 scored below grade level or had missing test data.[5]

Table 3

Distribution of Applications Into Major Program Categories, by Reading Level

Major	Above Grade Level (%)	On Grade Level (%)	Below Grade Level (%)
Law and Criminal Justice	10	7	5
Technical Trades	8	13	13
Business	8	14	15
Humanities	30	20	19
Math, Science, and Engineering	37	30	30
Medical and Health Careers	3	9	11
Fashion, Perf. Arts, and Graphic Arts	4	7	6
Total (N)	100 (8140)	100 (20307)	99 (9011)

The table shows a remarkable similarity between the choices of the average reading group and the below-average group, while the choices of the above-average group are distinctly different. About two-thirds of eighth graders who scored above grade level on their reading exam chose as their first choice a program in the humanities or

[5] This data is taken from a different data source than used in Table 2: hence, a slight difference in the total number of cases.

math/science/engineering categories while only half of those with average or below-average scores made a program in these two categories their first choice. Students with high reading scores also chose programs in law; many of these programs have a strong precollegiate focus. The other four career foci have a stronger tie to posthigh school employment; only twenty-three percent of the students in the high reading group chose a program in one of these categories, compared to forty-three percent of the students in the average group and forty-five percent of those in the low reading group.

The results of Table 3 are consistent with what common sense would predict. The students with high reading scores, who often make good grades, are more likely to have plans for college and are more interested in precollegiate programs. Some might wish for these students to choose a program which would give them other skills and experiences, but as long as colleges require high academic performance for admission and do not reward students for other kinds of school work, it is only rational for most college-bound students to concentrate on academics. The students in the average and low reading group are more likely to choose career-preparatory programs. Perhaps the only surprise is that in these groups only half of the students select programs with career training.

CHARACTERISTICS OF NEW YORK CITY ACADEMIC CAREER MAGNETS: SURVEY RESULTS

In the Spring of 1992 we conducted telephone interviews with the administrators of sixty-one academic career magnet programs. These sixty-one programs were selected as part of a larger study comparing the educational outcomes of students who attended these programs to the performance of students who applied to the programs but were turned away (Crain et al., 1992, Heebner et al., 1992). In order to make this comparison with the rigor provided by an experimental design, we studied only programs which selected half of their students by lottery. Not all academic career magnets in New York City use lottery admission; for example, none of the programs in fashion, fine arts, or performing arts do so. Only 86 of the 282 magnet programs in New York City select half of their student body randomly (New York City Board of Education, 1988). These eighty-six programs are known locally as "educational option" programs. Note that the respondents were "educational option" program administrators. Of these eighty-six programs, seventy-one have enough applicants to permit them to turn away students randomly, thus creating an

experimental design. Of the seventy-one, one program had ceased to exist by the time of the interview and nine others either refused or were unable to participate; thus, the survey was limited to sixty-one academic career magnet programs. All sixty-one were created within the last fifteen years, were intended to provide a mixed academic and career focus, and were programs where student demand exceeded the number of seats in the school.

The Array of Programs Represented in the Survey

As was brought out in the previous section on "The Big Picture in New York City," there is quite a wide array of magnet programs supplied to meet the needs of New York City high school students. In fact, among the 282 magnet programs, seven different major areas of study can be found. As is evident from Table 54, the sixty-one academic career magnets in our survey span six of these majors (excluding only the area of fashion and the arts): law; technical trades; business; humanities; math, science, and engineering; and medical careers.

We surveyed eleven academic career magnets whose focuses centered around the law theme, including programs in criminal justice, politics and community affairs, and legal studies for business. The law programs generally aim to expose students to all levels of law-related careers, from practicing law to court reporting, although some of these programs place a stronger emphasis on establishing the ground for higher education in the law field than on providing training for posthigh school graduation employment.

Only one of the programs in our survey falls in the area of technical trades, preparing its students in the aviation field. The program provides flying instruction and experience at a local airport, as well as training in aviation electronics, ground support vehicle maintenance and repair, aerospace and computer-assisted design, and meteorology.

Business programs abound in both New York City and our survey sample. Included in the twenty four such programs represented in our survey are programs in secretarial science, information processing, accounting, finance, and marketing, as well as general business academies. Again, while all of these academic career magnets operate with the aim of preparing students for both college and a career, programs in marketing and

finance clearly lean more towards establishing a base for further study, offering such courses as college accounting, than programs in secretarial science do.

The four humanities programs in our sample cover the fields of academic professions, communications, and international studies. Within this major alone students may find a colorful menu of careers to pursue, ranging from teaching to television, radio, film, and theater, to international trade and finance.

Math, science, and engineering programs are represented by eleven of the programs examined here. Within this major, we surveyed administrators of programs in human sciences, oceanography, computer science, veterinary science, agricultural studies, and mathematics/science studies. Students in these programs prepare to take on their future roles as computer scientists, researchers, animal care assistants, veterinarians, oceanographers, and even poultry production managers.

Ten of the programs in our sample fall into the medical careers major. We looked at programs in nursing and health assistantship, medical technology, and sports and recreational leadership. Here, as with other major areas, there is a wide range of types and levels of study, as students may choose to prepare for posthigh school entry-level employment as assistants or technicians, licensing in various medical fields, or higher education in health-related studies.

Measuring the Level of Integration Based on Key Program Components

Using the information provided by our previous reports on academic career magnets (i.e., the first phone survey done in 1991, the quantitative analysis, and the ethnography), the survey instrument was designed to investigate areas found to be of significance to the fulfillment of the academic career magnet's mission. As is shown by the actual questionnaire used (see the appendix), short-answer questions were asked on thirteen topics:

1. use of internships
2. program emphasis on careers
3. isolation of the program from the remainder of the school
4. job placement for graduates

5. use of specialized (noncomputer) equipment
6. previous work experience of faculty
7. extracurricular activities designed to facilitate the school-to-work transition
8. the amount of counseling
9. amount of academic counseling
10. amount of career counseling
11. use of computers
12. student projects
13. team versus individual project work

In addition, two open-ended questions were included at the end of the interview in order to tap into what the administrators considered to be (1) the most important aspects of their program, and (2) the most important things they thought they needed to improve their programs.

The administrators were asked to base their responses only on students in their academic career magnet program, excluding students in other academic career magnet programs in the same building or in the school's regular comprehensive program, and students in any English as a Second Language (ESL)/bilingual or special education programs. Most of the questions referred to all four high school grades, but certain questions required responses by grade level. (It should be noted that while data is provided for grades nine through twelve, some of the twelfth grade data is missing; an early version of the questionnaire omitted questions about that grade. The final version used in most of the interviews, found in the appendix, includes questions about the twelfth grade.)

The central task of this report is to determine how successful the new academic career magnets have been in integrating vocational and academic education. This integration requires the addition of a number of components to the traditional comprehensive high school, ranging from an internship and placement program to the development of specialized counseling rules to assist students in selecting their career and obtaining employment. In this section we report what school administrators believe they have and have not done in an effort to bring this integration about.

Internships

Internships and part-time work assignments provide an opportunity for "real-world" experience, building a bridge connecting school to work. Moreover, they provide

students with the opportunity to explore and test themselves in their chosen field while they still have time to alter their educational and career plans.

Five out of every six administrators responding to our survey indicated that at least some of their students do some sort of internship. As Table 4 indicates, internships are not used with ninth and tenth graders as much as with eleventh and twelfth graders. In the eleventh grade, one-third of the programs say that nearly all of their students are involved in an internship while a half say that only a few or no students are involved. The response for the twelfth grade is very similar once we allow for the fact that a large number of school administrators were not asked about the twelfth grade. Only nine of the sixty-one respondents said their school had no internship program at all. Table 5 shows that of the sixty-one programs, over a third (36%) required student participation in internships. In Table 6, the data shows that fifty-nine percent of the administrators said that the staff located internships for the students. These three questions were combined to produce a scale measuring the strength of internships. In studying the responses, we concluded that about a third of the schools had no internship program or a very small one, one-third had an internship program of a modest size, and another third had a well-developed program involving a large number of students. In Table 7, we present the frequencies on the composite scale. A decision whether to declare a program to be large or not is a necessity, although a somewhat arbitrary one. However, the twenty programs which we judged to have a well-developed internship program typically require internships, have staff involved in locating internships for students and involve nearly all the students in at least one of the two upper grades of the school.

Table 4

Proportion of Students Working on Internships or Part-Time Work Assignments

Proportion	9th Grade	10th Grade	11th Grade	12th Grade
None	58	47	15	11
Only a Few	2	8	14	2
About 25%		1	7	2
About 50%			3	5
About 75%			1	2
Nearly All	1	5	20	7
Missing			1	32
Total	61	61	61	61

Table 5

Internships: Optional or Required

Internships	# Programs	%
Optional	30	49
Required	22	36
No Interns	9	15
Total	61	100

Table 6

Who Finds Internships

Person(s)	# Programs	%
Student	7	11
Half/Half	9	15
Staff	36	59
No Interns	9	15
Total	61	100

Table 7

Internships Scale

Score	# Programs	%
2.01-3.00	20	33
1.00-2.00	18	29
0.00-0.99	14	23
No Interns	9	15
Total	61	100

Career Focus

The New York City high school system is highly decentralized. Directives from the central administration are interpreted by each principal in the light of their own particular situation. Thus, it came as no surprise to us that when we asked administrators, "Which one of these [terms] best describes your program: college preparatory, college preparatory with an emphasis on a career in a [specific field], or career preparatory?" one-quarter said they were college preparatory; one-fifth said they were career preparatory; only slightly over one-half said that they were both. However, the way that the administrators use labels can in itself be confusing. When we asked whether the program prepared students to work upon graduation from high school in a particular career field, four-fifths said that it did, suggesting that at least a few of the programs that described themselves as college preparatory did indeed prepare students for posthigh school work.

We followed this with a question which was less ambiguous, "Did the school provide students with a special employment certification or license?" Over half of the schools said yes. These two responses shown in detail in Tables 8, 9, and 10, were

combined to create a "career focus scale." The number of programs having low and high scores on the scale are shown in Table 11. Examining Table 11 might lead one to conclude that only half of these supposedly integrated programs in fact take seriously the task of preparing students for work. This may be misleading. In some cases, schools have a career focus, but the career is one requiring postsecondary education. The school is correct in saying that it is not training students for employment after high school, but nonetheless is career focused. At a minimum, there are at least seven programs in this group of sixty-one which do not in any way acknowledge that they are intended to provide any sort of career training.

Table 8

Primary Focus of Academic Career Magnet Program

Focus	# of Programs	%
College Prep	16	26
Both College Prep and Career Prep	31	51
Career Prep	11	18
Missing	3	5
Total	61	100

Table 9

Prepare Students for Work

Response	# of Programs	%
No	13	21
Yes	48	79
Total	61	100

Table 10

Offer Special Certificate

Response	# of Programs	%
No	27	44
Yes	34	56
Total	61	100

Table 11

Career Focus Scale*

Score	# Programs	%
.00	7	11.5
.33	1	1.6
1.00	5	8.2
1.33	10	16.4
1.67	2	3.3
2.00	9	14.8
2.33	16	26.2
2.67	2	3.3
3.00	6	9.8
Missing	3	4.9
Total	61	100.0

*Note: Career Focus Scale, .00 = College Prep 3.00 = Career Prep

Program Isolation and Identity

Because almost all of the career magnets are physically located within larger high schools—most of them comprehensive rather than career-oriented—it would seem that it is necessary to isolate the programs' students from the rest of the school in order to allow them to create a career training environment. Isolating them will permit them to socialize their students into their career and help them establish an identity.

When program administrators were asked whether students in their program usually took courses in separate classes, or whether they were in class with students from the rest of the school, answers were widely distributed from one extreme to the other (see Table 12). But again, we see that interpreting a single question may be misleading. We also asked whether the students had special classes that they took which other students in the school did not and here seven-eighths of the administrators said yes (see Table 13). Students take anywhere from one to four special classes each year in grades ten through twelve and these are generally yearlong rather than one semester courses. The mean number of separate classes at each grade is given in Table 14. Some respondents commented that ninth graders were not placed in specialized courses because it was necessary for them to meet many of their high school graduation requirements before specializing heavily.

Another way in which a program can establish a separate identity for its students is by having its own guidance counselors. Less than half of the programs have their own counselors as Table 15 shows.

Table 12
Students in Separate Classes

Classes	# Programs	%
Not Separate	16	26
A Few Separate	14	23
Half and Half	18	29
Most Separate	12	20
Missing	1	2
Total	61	100

Table 13
Students take Special Courses

Response	# Programs	%
No	7	11
Yes	53	87
Missing	1	2
Total	61	100

Table 14
Average Number of Special Classes by Grade

Grade	# Classes
9	1.93
10	2.55
11	3.24
12	2.79

Table 15
Shared or Program Counselors

Response	# Programs	%
Share	36	59
Both	7	11
Program	17	28
Missing	1	2
Total	61	100

At the end of the questionnaire respondents were asked, "What do you think are the most important aspects of your program?" In response, two of the administrators volunteered that their programs' distinct identity was one of its most important characteristics (see Table 16).

These five items were combined in a scale ranging from zero to five. Most of the scores were at the low end of the scale, indicating that by these criteria, most programs are not highly isolated from the rest of their school (see Table 17). In this scale as in the other scales described in this section, the items were combined by assigning a range of 0 to 1 for each item and summing them. The scale score here ranges from a low of 0.0 to a maximum of 3.0. The nine respondents who stated that they had no internship program were not asked specific questions about their internship, which prevents us from using the other questions to cross-check their statements that they have no internship programs.

Table 16
Most Important Aspect of Program: Distinct Identity

Volunteered	# Programs	%
No	59	97
Yes	2	3
Total	61	100

Table 17
Isolation Scale

Score	# Programs	%
0.00-1.00	21	34
1.00-1.99	26	42
2.00-2.99	11	18
3.00-5.00	1	2
Missing	2	3
Total	61	100

Note: Table 17 and future tables have percentages that may not add up to 100 due to rounding.

Placement in Employment

When students see others graduating and getting jobs based on the career training that they have received, they perceive the career preparation aspect of their curriculum as much more relevant to their lives. Program administrators were asked two questions: does their program help locate employment for students graduating and approximately how many graduates are actually placed in employment through the program? Table 18 shows that over half of the programs had employment placement programs (34 of the 61). We asked these programs how many students they placed: only nineteen of the thirty-four were able to answer, and their responses ranged from two students to seventy. For these nineteen programs, we computed a ratio of number of students placed to the total number of students graduating from the program. Table 19 shows the total number graduating and Table 20 presents the frequencies of the job placement scale. A high score (2.0) was given to each school which placed over twenty percent of its graduates in employment. Ten of the sixty-one programs fell into this category. Nine others placed less than twenty percent fifteen placed students but were unable to tell us the exact number, and twenty-seven said that they did not attempt to place students.

Table 18
Approximate Number of Graduates Placed in Employment by Program

# Placed	# Programs	%
None	27	44
1 to 9	10	16
10 to 39	5	8
40 to 70	4	6
Missing	15	25
Total	61	100

Table 19
Number of Graduates Per Year

# Graduates	# Programs	%
15 to 39	10	16
40 to 75	9	15
76 to 120	10	16
121 to 350	10	16
Missing	22	36
Total	61	100

Table 20
Job Placement Scale

Score	# Programs	%
.00	27	44
1.50	9	15
2.00	10	16
Missing	15	25
Total	61	100

Specialized Career-Related Equipment

Another index of the degree to which schools provide career-oriented as well as academic education is their use of specialized equipment related to their career specialization. We do not consider desktop computers to be related to any particular career; they will be discussed later. However, there are a number of other kinds of equipment which are important, such as medical equipment, for the many health career training programs in this sample. Among the programs surveyed, Table 21 shows that slightly over half (33 of 61) used specialized equipment and of these thirty-three, twenty-one say that their students will have typically used this equipment every week. The number of hours per week a typical student uses the equipment ranges from about 1 to a high of about more than 15; but when we average in the many programs which do not use specialized equipment, the average for all programs is only slightly more than one hour per week. Had we looked only at the thirty programs that used specialized equipment, the average would be slightly over two hours per week. The three items each scored on a 0-1 range are combined to create the overall scale shown in Table 24.

Table 21
Students Use Specialized Equipment Other than Computers

Response	# Programs	%
No	28	46
Yes	33	54
Total	61	100

Table 22
In Typical Week, Most Students Use Specialized Equipment

Response	# Programs	%
No	40	66
Yes	21	34
Total	61	100

Table 23
Average Amount of Time Students Use Specialized Equipment

Grade	# Hours
9	.79
10	1.05
11	1.48
12	1.01

Table 24
Equipment Per Week by Grade Specialized Equipment Usage Scale

Score	# Programs	%
0.00	29	47
1.50-2.00	11	18
2.01-3.00	21	34
Total	61	100

Teachers' Experience Working in the Field

One important way of bridging the school-to-work gap for students is employing teachers who have had experience working in the field for which they are preparing students. Fifty-one of the sixty-one administrators reported that at least some of the teachers in their program had such experience. As Table 25 shows, twenty-five programs—forty-one percent—reported that most of their instructors had experience.

Career-Related Extracurricular Activities

Most programs had developed a repertoire of tools for bridging the school-to-work gap. We asked about whether schools provided trips to work sites, special lectures, mentoring, résumé/interview skills workshops, and career-oriented clubs. Thirty-eight programs had career-related clubs (see Table 26). Among these the number of students involved in such clubs varied greatly from a low of five to a high of over five hundred with an average of thirty-six. As Table 27 shows, nearly all of the administrators said that the school made at least a few trips to worksites in the course of a year. The average number of trips is about five. Sixty programs invite outside speakers to the school. The number invited ranges from one to one-hundred per year (see Table 28) with an average of nine. Table 29 indicates that nineteen of the fifty-eight administrators responding to the questionnaire said that their school had a mentoring program "that matched students with professionals in their field who meet with the students regularly." The average number of mentors which a school has available is eight. Some programs provide workshops to help students to develop their skills in preparing résumés and interviewing. Of the twenty-four programs that have workshops, thirteen hold five or fewer workshops per year, six hold more than five, and five were unable to answer (see Table 30). The overall distribution of scores on a scale combining these five questions is shown in Table 31.

Table 25
Instructors with Work Experience

Proportion	# Programs	%
None	10	16
A Few	19	31
Half	6	10
Most	25	41
Missing	1	2
Total	61	100

Table 26
Number of Students in Career-Related Clubs

# Students	# Programs	%
None	23	38
1 to 20	11	18
21 to 40	9	15
41 to 75	8	13
76 to 557	6	10
Missing	4	7
Total	61	100

Table 27
Number of Trips to Worksites per Year

# Trips	# Programs	%
None	5	8
1 to 9	49	80
10 to 75	6	10
Missing	1	2
Total	61	100

Table 28
Number of Outside Lecturers per Year

Lecturers	# Programs	%
0 to 5	30	49
6 to 10	16	26
11 to 15	6	10
16 to 100	6	10
Missing	3	5
Total	61	100

Table 29
Mentors Used by Program

# Mentors	# Programs	%
None	39	64
1 to 10	4	6
11 to 20	7	11
21 to 100	8	13
Missing	3	5
Total	61	100

Table 30
Workshops on Résumé Writing and/or Developing Interview Skills

# Workshops	# Programs	%
None	36	59
1 to 5	13	21
6 to 20	4	6
21 to 40	2	3
Missing	6	10
Total	61	100

Table 31
School-to-Work Tools Scale

Score	# Programs	%
0.75-2.00	13	21
2.01-3.00	15	25
3.01-4.00	18	30
4.01-5.00	4	6
Missing	11	18
Total	61	100

Table 32
Scale of Counseling Availability

Score	# Programs	%
0.50	8	13
1.00	23	38
1.50	16	26
2.00	9	15
Missing	5	8
Total	61	100

Counseling Services

Academic career magnets in New York City have developed different approaches to the counseling function typically found in high schools. In addition to the traditional guidance counselor, one may find a number of adults in different positions (e.g., teachers, administrators, as well as counselors) within the school setting playing the

counselor/advisor role as grade advisors, college counselors, career/employment advisors, placement service personnel, and program coordinators. Some academic career magnet programs have separate counselors assigned exclusively to their program, others share counselors with the other portions of their building, and some have a mixture of program counselors and schoolwide counselors at their service. The counseling function may also be broken into career counseling, academic, and personal counseling, although there seems to naturally be quite a bit of overlap in these areas.

The number of counselors available to a student in a program ranges from as few as 1 to as many as 11.5. The average caseload assigned to each counselor runs from a low of 100 to an alarmingly high 900 with a mean of 356. Table 32 is a scale of counselor availability based on the assumption that a large number of counselors available to the program and a small counseling caseload are both beneficial to students. However, only nine of the sixty-one programs score high on both these criteria. Unfortunately, in New York City, having inadequate counseling services is a common problem certainly not specific to academic career magnets (Heebner et al., 1992).

Academic Counseling and Career Counseling

For our purposes, it is important to separate the counseling function into separate academic and career counseling components. In the traditional comprehensive school there is relatively little career counseling; in the transition to a balanced academic career integration, counseling should shift in the same way. The data is clear that academic counseling is stressed more than career counseling. Most programs do not have any counselors who are dedicated exclusively to their program, so it would be very difficult for them to provide career counseling when their responsibilities cover the entire school. Only thirteen of the sixty-one programs have counselors who specialize exclusively in career counseling (see Table 33). Most respondents say that their counselors do both academic and career counseling but only a fourth of the respondents believe that their counselors spend as much time on career work as they do on academics. (Table 15 reports the number of programs which have their own counseling staff and the number of those who share their staff with the rest of their building.)

We constructed separate academic and career counseling scales based on three measures: (1) for the career counseling scale we examined whether the program had specialist career counselors; (2) whether the counselors who were designa[illegible]s both

academic and career counselors spent as much time in career counseling as they did in academic counseling; (3) and whether the program shared counselors with the remainder of the school or had its own separate counseling staff. Presumably a separate counseling staff would be better able to provide the specialty counseling that the program's particular career focus required.

Since each of these three variables are on a 0 to 1 scale, this produces a scale with a possible range of 0 to 3. However, the scale scores were generally quite low in that range, reflecting the fact that schools had relatively few career counselors, that most counselors who shared academic and career duties devoted more of their time to academic counseling and that most counselors in the magnet programs were shared with the rest of the school rather than specializing in this program. The overall scale (see Table 34) shows that half of the programs have career counseling scores in the lowest sixteenth of the scale (.5 or lower).

Table 33
Availability of Academic vs Career Counseling

# Counselors	# Academic Counselors	# Career Counselors	# Do Both
None	43	48	12
1	10	9	10
2	3	1	16
3	3	3	3
4	1		3
5	1		7
6			1
7			2
8			1
9			1
10			3
11			1
11.5			1
Mean	.607	.328	3.074

Table 34
Availability of Career Counseling Scale

Score	# Programs	%
.00	23	37.7
.25	2	3.3
.33	5	8.2
.50	4	6.6
.75	1	1.6
.83	1	1.6
1.00	12	19.7
1.08	1	1.6
1.25	4	6.6
1.33	1	1.6
1.42	1	1.6
1.50	4	6.6
Missing	2	3.3
Total	61	100.0

We also computed a measure of the degree of academic emphasis among the counselors using two measures: (1) the proportion of the school's counselors who were designated as full-time academic counselors and (2) the number of counselors who were

identified as sharing their work between academic and career counseling, adjusted by whether the respondent said that these counselors emphasized academics more than career counseling. The scale is similar to the career counseling scale, with a range of 0 to 2, a mean of .5 and a standard deviation of .3 (Table not shown).

Computer Usage

An overwhelming ninety percent of program administrators indicated that their students use computers either in classes or in a computer lab (see Table 35). The number of computers available varies greatly with some schools having as many as 250 (see Table 36). In about half of the programs, students use computers regularly each week (Table 37). Of the ninth grade, two-fifths of the students do not use computers at all and those that do typically spend half an hour per day with them. Computer usage improves in the tenth and higher grades with four-fifths of the students using computers. Table 38 shows the mean hours per week that all students use computers in each grade. Finally, we asked program heads how much their students used computers relative to the other students in their school building and nearly half said that their students used computers more and only one-sixth said that they used them less (see Table 39). Interpretation of this data is difficult because computers are such a widely used tool that it is hard to know if increased computer usage reflects emphasis upon career training or not; but many programs use computers in mathematics and other classes where students are not being prepared for specific careers. An overall scale of computer usage (see Table 40) based on the five specific questions about computers shows scores toward the high range of the scale. It would seem safe to conclude that the majority of the students in these programs are receiving some familiarity of computer work before graduation.

Table 35
Students Use Computers in Class/Lab

Response	# Programs	%
No	6	10
Yes	55	90
Total	61	100

Table 36
Computer Availability

# Computers	# Programs	%
0-30	14	23
31-80	17	28
81-150	15	24
151-250	15	24
Total	61	100

Table 37
In a Typical Week, Most Students Do Some Work Using Computers

Response	# Programs	%
No	27	44
Yes	31	51
Missing	3	5
Total	61	100

Table 38
Hours Per Week, by Grade, Students Use Computers

Grade	# Hours
9	1.54
10	2.32
11	2.72
12	3.01

Table 39
Program's Computer Use Compared to Rest of School

Usage	Frequency	%
Less	10	16
Equally	15	25
More	29	47
Missing	7	11
Total	61	100

Table 40
Computer Usage Scale

Score	Frequency	%
0.00-2.50	12	20
2.51-3.50	13	21
3.51-5.00	23	38
Missing	13	21
Total	61	100

Independent Projects

Nearly all of the programs said that students had opportunities to do independent projects. Furthermore, a number of students are doing so in over half of these programs. Table 41 shows the number of students involved in independent study at each grade. While in the ninth grade, two-thirds of the programs say that only a few students at most are involved in independent study, by eleventh and twelfth grade a majority of the program participants say that at least one-fourth of their students are conducting independent work. We asked what the average number per week that any average student might work on these projects and Table 42 shows the mean across all of the programs was two and a half hours per week in the upper grades. These two measures are combined to create a scale of project involvement.

Table 41
Proportion of Students Working on Independent or Team Projects in a Typical Week

Proportion	9th Grade	10th Grade	11th Grade	12th Grade*
None	28	13	5	2
Only a Few	14	20	16	3
About 25%	2	7	7	3
About 50%	2	3	10	4
About 75%	1	1	1	2
Nearly All	13	16	21	7
Missing	1	1	1	40
Total	61	61	61	61

*Note: For a major proportion of the phone interviews, program administrators were only asked about ninth through eleventh grades.

Table 42
Average Hours per Week Students Work on Projects

Grade	# Hours
9	1.13
10	1.79
11	2.41
12	2.88

Table 43
Project Work Scale

Score	# Programs	%
0.00	4	7
0.01-1.00	34	56
1.01-2.00	20	33
Missing	3	5
Total	61	100

Team Work Versus Independent Study

There has also been a movement in some of these schools toward involving students in team projects as well as independent study, apparently in an effort to help students develop interpersonal skills which presumably will be useful after graduation. As Table 44 shows, programs were as likely to stress team projects as independent study. A scale of team project work was developed based on the extent to which students are involved in projects and whether the projects were primarily team or independent (see Table 45).

Table 44
Student Projects: Mostly Independent or Team

Response	# Programs	%
Independent	22	36
Half/Half	12	20
Team	23	38
Missing	4	7
Total	61	100

Table 45
Team Versus Independent Projects Scale

Score*	# Programs	%
.00	26	42.6
.10	3	4.9
.20	12	19.7
.30	1	1.6
.40	4	6.6
.50	4	6.6
.60	5	8.2
.80	3	4.9
1.00	3	4.9
Total	61	100.0

* Note: .00 indicates more independent project work; 1.00 indicates more team project work.

Most Important Aspects of the Programs

We asked administrators to identify the most important aspects of their programs. Since the question was open-ended, there was a wide variety of answers falling into twenty-one distinct categories ranging from concrete aspects of curriculum and instructional technique to such personal qualities as staff identification, program cohesiveness, or student motivation. Respondents could contribute as many as ideas as they wished. In Table 46 we report the number of times that a respondent saw students receiving career preparation as an important aspect of the program. One-half of the administrators gave at least one statement about the importance of career preparation and five respondents gave two or three statements about career preparation. The other most common program characteristic mentioned dealt with the personal attention the students receive and the amount of motivation the program provides to them. Typical responses were that the

program staff was dedicated, that students received personal attention, and that the program had a strong sense of cohesiveness and purpose. Forty-one of the sixty-one administrators stressed some aspect of the program's impact on the personal attitude of students (see Table 47).

Table 46

Most Important Aspects of Program: Career Preparation

Responses	# Programs	%
.00	30	49
1.00	26	43
2.00	4	7
3.00	1	2
Total	61	100

Table 47

Most Important Aspects of Program: Personal Quality

Responses	# Programs	%
.00	20	33
1.00	36	59
2.00	5	8
Total	61	100

Administrators' Proposals for Change

The administrators were also asked, "What changes do you think would most improve your program?" Their responses ranged over a number of areas. There were, of course, many statements about the need for additional funding. Beyond that, the five most common proposals were as follows:

1. more career-oriented learning
2. curriculum expansion and revision
3. better students
4. better staff
5. more individual/individual attention

Nearly half of the respondents gave enhancing career-oriented learning as an important path to improve their program (see Table 48); nine respondents gave two or more specific ways in which career-oriented learning could be enhanced. Examples were increasing contact with employers, partnerships with firms and other agencies, more mentoring, more internships, and more job placement.

Despite the considerable controversy on the random assignment of students to these programs, only ten of the sixty-one administrators thought that an important way to improve their program would be to recruit better students. Some referred to needing students who were better prepared, more committed, or more interested, while others

talked about changing the student selection process. Some complained about random selection while others thought that the feeder middle schools were lax in preparing students for high school work (see Table 49). Fifteen respondents complained of the need to have a larger or better staff (see Table 50). Proposals for change in this area included improving recruitment, increasing salaries, and increasing staff development. Some respondents complained about the difficulty of recruiting teachers who were qualified in the program's career area.

Table 48
Changes That Would Improve Program: More Career-Oriented Learning

Responses	# Programs	%
.00	34	56
1.00	18	29
2.00	9	15
Total	61	100

Table 49
Changes That Would Improve Program: Better Students

Responses	# Programs	%
.00	51	84
1.00	10	16
Total	61	100

Table 51 shows that nine respondents talked about the need for the program to provide more individual and personal attention to students. Some wanted smaller classes, others wanted more individualized instruction, others wanted more time for personal supervision of students, and still others wanted more teachers involved in the counseling process or they wanted the program reduced in size.

Table 50
Changes That Would Improve Program: Better Staff

Responses	# Programs	%
.00	46	75
1.00	14	23
2.00	1	2
Total	61	100

Table 51
Changes That Would Improve Program: More Individual/ Personal Attention

Responses	# Programs	%
.00	52	85
1.00	7	11
2.00	2	3
Total	61	100

Finally, nineteen respondents talked about the need to improve the curriculum (see Table 52). Some referred to the need for more interdisciplinary classwork and more integration of academic and career education. Some talked about the need for more individualized instruction and others about reducing the number of academic requirements.

Respondents often complained about the rigorous demands of the state regulations, which limited the amount of career-oriented teaching that they could do because of the need to meet a large number of mandated academic requirements.

Table 52
Changes That Would Improve Program: Curriculum

Responses	# Programs	%
.00	42	69
1.00	17	28
2.00	1	2
3.00	1	2
Total	61	100

A Profile of an Idealized Career-Oriented Program

Having described a number of individual program components, the next task is to create a synthesis of them. When we do this, we find a group of program components which seem to go together and appear to be present in those programs which have a strong career program identification. Table 53 shows a correlation matrix of the thirteen program components, the two responses about what is best about the program, and the five most common responses about what additional improvements the programs need. The correlations show which program components tend to appear together in the same program or (if the correlation is strongly negative) which components tend to not appear in the same program. With only at most sixty-one responses, very strong relationships are needed for statistical relationships. Nonetheless, there is a group of statistically significant correlations which permit us to identify some groupings of the program characteristics.

The first six program characteristics are related to each other—all six are positively correlated with each other and each of the six has a significant correlation with at least one of the other members of the group. Taken together, they suggest that there are a group of programs which have in common the fact that they

- are highly isolated from the remainder of their school,
- have a heavy focus on career preparation,
- use internships while students are in school,
- have a placement program for graduates,
- have faculty with experience working in the career field, and
- place a strong emphasis on career counseling.

Table 53

Correlation of Scales

Scales	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Internships	1.0	.44*	.21	.29	.29	.09	.18	-.11	-.45*	-.06	-.22	-.28	-.34	.27	-.27	-.08	.21	-.26	-.03	-.05
2. Career Focus		1.0	.10	.33	.47**	.33	.35*	.21	-.42*	-.18	-.24	-.14	-.24	.23	-.18	-.12	.09	-.14	.20	-.29
3. Prog. Isolation			1.0	.53**	.03	.59**	-.11	.15	.57**	-.19	-.17	-.13	-.26	-.00	-.31	.11	.25	.04	-.20	-.11
4. Placement				1.0	.41*	.23	.09	.38	.21	-.06	.10	-.36	-.18	-.13	-.20	.03	.09	-.08	-.32	-.00
5. Faculty Exp.					1.0	.22	.21	.10	-.13	.03	.01	-.13	-.24	-.20	-.07	-.05	.06	-.08	-.13	-.19
6. Career Counseling						1.0	-.19	.00	.45*	-.03	-.42*	-.09	-.25	.06	-.14	-.09	.37*	-.09	-.14	-.31
7. Special Equipment							1.0	-.06	-.37	.01	-.06	.24	.11	-.10	-.18	.11	-.16	-.11	.04	-.01
8. School-to-Work Transition Tools								1.0	.00	-.40	.03	.16	.31	.44*	.16	-.02	-.32	-.14	.08	.08
9. Computer Usage									1.0	-.01	.02	.06	.03	-.36	.01	-.08	.	.27	-.15	.09
10. Counseling										1.0	.19	.14	.23	-.22	.21	.01	.33	-.23	-.29	.08
11. Academic Counseling											1.0	.09	.24	-.24	.12	.16	-.15	.23	.04	.18
12. Projects												1.0	.55**	.00	.18	.03	-.16	.07	.24	.14
13. Teamwork													1.0	-.17	.44**	-.04	-.30	-.16	.03	.40*
14. Best Aspect: Career														1.0	-.23	-.18	.10	-.00	.21	-.26
15. Best Aspect: Personal															1.0	-.21	-.13	-.10	-.16	.64**
16. Need: Career																1.0	-.39*	.08	-.21	-.20
17. Need: Better Students																	1.0	-.26	-.21	-.14
18. Need: Curriculum Imp.																		1.0	.06	-.22
19. Need: Better Faculty																			1.0	-.17
20. Need: Individual Attention																				1.0

* - Signif. LE .05 ** - Signif. LE .01 (2-tailed) "." printed if a coefficient cannot be computed

Looking only at significant correlations, we see that schools which place a large number of their students tend to have highly isolated programs and tend to have a number of faculty with experience in the career field. Isolated programs have a large amount of career counseling, and programs with a large number of faculty with field experience tend to say that they have a strong career focus. In addition, programs with a strong career focus often have strong internship programs. We suggest that these six characteristics together define a well-implemented career program, but the situation is more complex than that. It is probably more accurate to say that one common type of career program relies heavily on these six components. Looking at the remainder of the correlation matrix, we see that programs with strong focuses often emphasize the use of special equipment. Many of these are programs in health or in other fields where there is specialized hardware that must be mastered. It is interesting that heavy use of computers (variable 9) is not positively associated with all of these variables. In fact, it is significantly related to career counseling but significantly negative by correlation with the use of internships. We think that the complexity here is because computers can be used in a variety of ways, preparing students for specialized careers such as secretarial work which does not necessarily involve placing students as interns. It may also be used to prepare students for advanced career training in colleges and universities (i.e., as work in medical science).

It is perhaps most interesting that the six components of career orientation which seem to go together to make up a career-oriented program (1) are not strongly correlated with the uses of mentoring, lectures, and field-trips which make up what we call the school-to-work tools; and (2) are generally negatively correlated (although not significantly so) with the use of individualized projects and teamwork. Part of the problem is that individualized projects and teamwork can be used in academic settings as well in career-oriented programs. Another part of the problem is that individualized projects and team projects may be used to simulate career work in fields where internships are difficult to obtain. Finally, the use of individualized and team projects may be a substitute for specific career training in schools which emphasize development of personal skills and a strong work ethic rather than training to obtain a specific occupational certificate. One of the things that supports this argument is the significant positive correlation between teamwork and variable 15, whether the school administrators identify the particular important part of their school as being its ability to deliver personal attention to students. Administrators who say that their school does a great deal of teamwork are also likely to say that their greatest need is to provide even more individual attention to students.

Administrators who see their program's strength as being their ability to provide a strong interpersonal environment for their students are the same ones who want to further strengthen the amount of individual attention they give to their students. This suggests that there are a group of program administrators who are committed to providing an education program with a strong emphasis upon developing character and providing emotional support for students. However, none of the six career-orientation factors in the top of the table are positively related to either wanting to provide greater individual attention or believing that the interpersonal environment that they provide for their students is an important part of their program now. In fact, the schools which emphasize school counseling (variable 6) tend not to exchange their students, arguing that they need better students to carry out their program. All six of the variables strongly related to career preparation are positively related to the administration's belief that they need better students to make their programs succeed.

Thus, we see the beginnings of a separation of these programs into two groups. While the data is not as strong as we would like, it raises this possibility. One group of programs is committed to career preparation with a goal of preparing students for a specific certificate or preparing them to be placed in jobs immediately after graduation. Because these programs must provide students who meet the standards required by the certification or the standards set by the personnel officers they must deal with, these programs worry that the raw material that they must work with is not strong enough. These are the programs where random assignment is unpopular and where the need to educate students at all levels of reading ability seems to present problems. At the other extreme we have a group of career-oriented programs which seem content to work with the students that they are given, developing project work for students and working to create a school environment in which students can develop. If we are right in reading this correlation matrix in this way, the division of these programs into these two groups may be a useful analytic approach. It also raises some interesting dilemmas.

Career education has often been seen as a place to put students who are unsuited to academic work. In fact, these tables suggest that the standards of career-oriented programs are in some cases higher than those of comprehensive programs. This may also explain why some of the seemingly best programs have a very high number of students transferring back to comprehensive schools (Heebner et al., 1992). At the same time, we also see that a number of other academic career magnets may be providing students with a

sort of "alternative school" setting in which personal growth can be nurtured through the use of career training not merely to enable students to obtain employment after graduation but as a context in which to develop individual student potential.

The idea that a dilemma exists between job placement and human development is reflected in the significant negative correlation between administrators expressing a need to strengthen their career training and administrators expressing a need to obtain better students. Programs which are satisfied with their students wish they had a stronger career program; programs which are satisfied with their career program wish they had better students.

Summary

One of the most difficult tasks confronting a teacher is deciding what level of performance should be considered adequate to obtain a passing score. Similarly, one of the most difficult tasks confronting an evaluator is deciding what level of performance can be considered satisfactory. We report here the responses of program administrators to questions dealing with thirteen areas in which we believe a comprehensive high school program must be changed if it is to integrate academic and career-oriented work for its students. Our best advice is to ask the reader to read the questionnaire in the appendix and look at the responses to those various questions in Tables 4 through 52. The reader is probably more qualified than we are to decide what level of performance they would consider satisfactory.

Perhaps the most negative finding is that only a small fraction of these schools are able to place as many as one-fifth of their graduates in employment. However, we cannot blame the schools for a weak labor market and given the extraordinarily high employment rate among inner city high school graduates, even this result may be viewed as encouraging.

Alternative Approaches to the Integration of Academic and Career Education

We have seen that the integration of academic and career work has not been accomplished in all schools. In order to help us understand why some schools have been able to do this while others have not, we looked at the degree of integration in programs with different majors. We looked at only two variables which we felt the successful integration of vocational and academic work necessarily requires: (1) that the school be committed to providing entry-level employment after high school as well as preparation for higher education; and (2) that the program isolate students from the other students in the building in order to provide them with an academic program which integrates their career interests with their academic studies.

The integration of academic and career education is more difficult for certain programs than for others. In some career fields, integration comes somewhat naturally; in others, achieving integration requires starting at almost zero and developing new curricula. Table 54 compares the degree of career focus (using the scale discussed earlier and presented in Tables 8-11) for programs in six different major areas: law and criminal justice; technical trades; business; humanities; math, science, and engineering; and medical careers. Each row of the table shows the proportion of programs which score very low, low, medium, or high in their level of career focus.[6]

Table 54 shows that the level of career focus is quite low for the law and criminal justice and humanities areas. Most of the eleven law programs that we studied concentrate on preparing students to attend college and do little to help students find employment in the criminal justice field directly out of high school. In most of these programs, law is used as a motivational tool to encourage students to go on to college so they may enter law school later. By not emphasizing other positions in the criminal justice system such as court reporting or policework they provide less career direction for those students who are not college-bound.

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[6] The number of cases are weighted by the number of applicants to each program so that small and/or unpopular programs will be discounted, while programs that have larger numbers of students or are in large demand are given greater weight.

Table 54
Cross-Tabulation of Career Focus by Major

	Career Focus				
Major	Very Low	Low	Medium	High	Row Total
Law and Criminal Justice	26.7	27.8	45.5		100.0 (11)
Technical Trades			100.0		100.0 (1)
Business		35.0	55.9	9.1	100.0 (24)
Humanities	28.8	71.2			100.0 (4)
Math, Science, and Engineering	9.2	13.4	74.5	2.9	100.0 (11)
Medical Careers	12.7	8.9	31.0	47.5	100.0 (10)
All Programs	10.7	24.2	53.7	11.4	100.0 (61)

The humanities programs have serious problems in this respect. To some degree, communication is a major component of these programs and of critical importance in nearly all employment, so they are teaching a useful work-related skill. However, because they teach the skill only in its more general terms, perhaps under the label "communication," they are not as likely to give students detailed preparation for work in a particular industry. Some of these programs are like the law programs in that their emphasis is on preparing students for a career which requires a college degree.

The fact that a program has a specific career objective does not necessarily mean that it will integrate academic and career education. Table 55 shows the degree to which the students in each of these programs are isolated from the remainder of their school for their education. If students are not separated from the rest of their school, it is not possible to relate their academic studies to their career work, since other students in the same classroom will have different career goals. Note the large number of programs in medical careers whose students are not isolated from the remainder of their schools. These programs are highly career-oriented, but they make little effort to keep their students together for academics or to offer them academic courses that have a special focus on health. This means that in many of these comprehensive high schools, the medical careers programs function much like the traditional vocational track for students who take academics in the comprehensive school and are together to study medicine as their

vocational elective. The one technical trade school also has a low level of program isolation. However, we will ignore this school since it is only a single case and not typical of other trade schools in New York City.

Table 55
Cross-Tabulation of Program Isolation by Major

	Program Isolation				
Major	Low	Medium	High	Very High	Row Total
Law and Criminal Justice	36.4	37.0	26.6		100.0 (11)
Technical Trades	100.0				100.0 (1)
Business	21.8	29.3	46.9	2.0	100.0 (24)
Humanities	35.7	64.3			100.0 (4)
Math, Science, and Engineering	25.0	47.0	28.0		100.0 (11)
Medical Careers	19.8	80.2			100.0 (10)
All Programs	27.8	44.2	27.4	0.7	100.0 (61)

In contrast to these programs which have difficulty balancing career focus and academics, either because the programs are too academic in focus—like law and humanities—or too career-oriented—like the medical careers programs—the programs in business and in math, science, and engineering seem to go further to achieve a balance. Both of them have a relatively high level of program isolation, meaning that their students are grouped together for more courses, and a relatively high level of career focus, meaning that they are preparing students not only for college but also for employment. In both cases, there is a relatively close match between the school's academic program and the career teaching there. The business schools tend to focus on the mathematics involved in finance and accounting and the language skills involved in office work. Courses such as Mathematics of Finance and Business English can be substituted for required mathematics and English courses, so that there is not as great a problem with meeting state academic requirements. Similarly, the math, science, and engineering programs tend to focus on applied mathematics and science in such courses as computer programming, agriculture, and animal husbandry. In these career areas, it is easy to focus on the career of study in

academic courses in mathematics and science, so that one would expect the students in these areas to be isolated for these academic classes.

All five types of programs (excluding the technical trade school) are successful in the sense that they send a number of students on to college, but it would appear that only the business and math-science programs have an easy time integrating academic and career classroom work.

One oversimplified answer to the question, "When is it difficult to integrate vocational and academic education?" is to say that it is difficult to do this when the school is committed to an academic education which does not have a clearly defined set of employment objectives for its high school graduates. This is the case with most of the law programs and many of the humanities-based academic career magnets. It is also difficult to integrate academic and career work when the career training is too far removed from academic studies. Whereas a school which directs students towards business has little difficulty organizing a course in "Business English," it is much harder for a school which focuses on medical careers to develop a course in medical English. Similarly, while a business program can easily create a course in mathematics for accounting or a course in computer programming, the health training program tends to use specialized medical equipment rather than computers and cannot easily apply high school-level mathematics to the training of medical assistants, for example.

While it is, no doubt, possible to integrate academic and career work in many fields, it is clearly more difficult to do so in some fields than others. In the case of the law program, it requires a faculty which is willing and able to teach all phases of the criminal justice sector, including legal secretarial work, law enforcement, probation and parole, as well as law itself. In the case of medical careers, it requires a local staff which can develop new courses which integrate medical training with traditional academics.

The Demand for Integrated Academic and Career Education Among Students at Different Reading Levels

A major concern in the development of high school programs which integrate academic and career education is whether the programs will be able to reach those students they are intending to serve. Many critics of magnet schools argue that they end up serving only the more able students, especially students from better educated or more affluent families. A school system intent upon providing an integrated academic-career education must not only provide programs but make sure that these programs reach the students for whom they are intended.

In the last part of this section, we will look at the choices made by students with low reading scores in contrast to the choices made by students with high reading scores. There are several different viewpoints of the differences between these groups. Some critics of the schools would argue that there is too much tracking of students with poor reading scores into programs which prematurely limit their options for higher education. From this point of view, it would be important for students with low reading scores to select high schools with strong college preparatory programs. There are other critics who argue that the traditional college preparatory high school is a great disservice to these students because they are unlikely to attend college, and by putting them in a college preparatory environment, they are deprived of the more practical opportunity to acquire skills which would enable them to gain employment after graduation. Perhaps the most complex argument is that advanced by Heebner et al., (1992) which contends that providing students with strong training for employment actually encourages them to attend college. Students feel economically secure knowing that they have an employment opportunity available to pay their way through college or to serve as a fallback if they decide against higher education. The advocates of the academic career magnets argue that it is possible to prepare a student for both work after high school and college attendance; therefore, it is not really necessary to make the difficult choice between preparing for college and preparing for a career.

In Table 56, we show the percentage of students with low, medium, and high middle school reading scores who choose programs where a large number of faculty have outside work experience. Table 53 shows that programs whose faculties have a good deal of experience are also programs which have other attributes of a strong career education.

Table 56
Outside Work Experience of Faculty by Reading Ability

Reading Ability	Outside Work Experience		Row Total
	Below Mean	Above Mean	
Above Grade Level	24.4	75.6	100.0 (2,298)
Grade Level	15.0	85.0	100.0 (7,196)
Below Grade Level	14.0	86.0	100.0 (2,967)
All Programs	2,055 16.5	10,406 83.5	12,461 100.0

Students with average and low reading scores are equally likely to choose programs where many faculty have work experiences while students with higher reading sores are less likely to choose these programs. The students with low and average scores are choosing programs with many faculty with related work experience mostly because they are choosing programs in business and medicine where more faculty have work experience. This table thus reinforces the earlier finding that students with average and low reading scores are more likely to choose career-related programs. Since the career-related programs presumably provide a college preparatory education, some readers will still be concerned that so many of these students choose traditional academic programs.

CONCLUSIONS

There is great interest in integrating vocational and academic education in high schools. This movement comes both from academics and practitioners. However, an important open question is the feasibility of this effort and the amount of resistance to it that can be anticipated from educators and from students.

In this report we have focused only on the question of whether programs intended to integrate vocational and academic work can be widely created in a major school district and if they will contain the necessary elements for successful integration. We have not looked at all at what happens inside classrooms, so we have not asked whether individual

teachers can integrate vocational and academic work in their own courses (i.e., we have examined within-program rather than within-classroom integration).

In order for vocational and academic integration to occur in a set of new career-oriented academic programs, five conditions will need to be met:

1. School systems must be able to create magnet schools generally.

2. School systems must be able to create magnet schools which have a focus on the integration of vocational and academic work.

3. These vocational and academic magnets must be successfully implemented.

4. Students must express an interest in attending magnet schools.

5. Students must want to attend the magnets which integrate vocational and academic work.

Our test site for this study, the New York City public schools, is probably a more favorable than unfavorable setting for a test of the feasibility of vocational and academic integration. First, it is a very large school district, crisscrossed with mass transit, so that there is a large market of students and schools. Second, the school district has had a history of innovation, so that new efforts are as much the rule as the exception. This analysis can be summarized as follows:

1. New York City has 282 magnet programs. Some are academic, some vocational, and some both. Some are alternative schools. Some are schools-within-schools in neighborhood comprehensive high schools; others are in buildings dedicated exclusively to magnet programs. Some admit students by a special test or audition, others by a review of academic records and student interest, others by lottery, and others, which we call "academic career magnets," are admitted half by lottery and half by school review of the student's record.

2. The magnet programs provide seats for five-eighths of New York City's high school students, with only three-eighths in comprehensive programs in neighborhood schools. New York City has developed well over a hundred academic career magnets in the areas of business; law; math, science, and

engineering; humanities; medical services; and fashion, performing arts, and graphic arts.

The New York City high school application process strongly encourages applications to magnets, and eighty-one percent of all eighth graders apply to a magnet school.

About one-half of all students applying to magnet schools applied to academic magnets, one-tenth to vocational programs, three-tenths to programs with an academic-vocational focus, with the remaining one-tenth choosing bilingual and special education programs. The most popular programs with a focus on combined vocational and academic training are in business, followed in order by medicine, fashion and the arts, and law and criminal justice. These programs could meet only about two-thirds of the student demand for them.

Programs vary greatly in their degree of career preparation. Four-fifths of the academic career magnets state a commitment to both academic and career training, but only about one-half have career training components in place at a significant level. Programs also vary in the extent that they have replaced the traditional comprehensive school curriculum; about half have adopted special courses for their students with team projects, heavy use of computers and other equipment, and an emphasis on a positive interpersonal climate.

Students with high reading scores choose math, science, and engineering, humanities, and law programs more, while students with average or low scores choose more careeroriented programs. Students with low reading scores also choose schools where faculty have related work experience. They show little tendency to avoid academically rigorous schools, but they often choose schools with career programs and job placement programs.

What then do these findings imply about the five conditions for the success of programs based on vocational and academic integration?

1. Can magnets be created? Here the answer is an emphatic yes. New York City has been able to put together hundreds of magnet programs and magnet schools over

the last two decades. It has done so on a relatively tight budget, with many of the magnets created with virtually no special funding. The school district has also been able to put together an application and admission system which is efficient and has experienced little controversy, except for some continuing, but low-keyed arguments about racial justice and economic stratification, which seems unavoidable in any large city.

2. Has New York City been able to create magnets which are intended to integrate vocational and academic education? New York City, with its loose administrative structures and the presence of many advocacy groups, achieves innovation by putting together a loosely coupled collection of programs allowing ample local autonomy to win the support of diverse constituencies. This seemed to be an accurate description of the creation of magnet schools during the 1970s and 1980s. It has worked to reduce controversy, but it has not created very much internal consistency. In analyzing the data, we conclude that a very large number of programs intended to bridge the gap between academic and career education have been created. But these magnets are by no means the only types of magnets in New York City. A large number of other magnets have been created which are purely academic in focus and there are many vocational programs which have not been altered to incorporate programs to attract college preparatory students or to teach "all phases of the industry." Having said this, we are encouraged that after only a little more than a decade of effort, two-fifths of the magnets in New York City have a stated intention of presenting academics and career training in the same setting.

3. How successful have the magnet schools been in implementing curricula which integrate vocational and academic goals? We attempted to answer this question with a survey of a collection of magnets; some of which were primarily academic, and others committed to career education. While nearly all of the programs claimed an interest in career education, we judged that half have actually put a program in place which appears to serve the goal of career education. It is possible that a few of these may have sacrificed some of their academic goals in order to achieve this, but we did not study this question. We were not surprised that some of the programs were relatively unsuccessful in implementing a career-based program. The natural inertia of high schools and the fact that most high schools have committed themselves to academic education for the last century would not lead anyone to be optimistic about their ability to change course quickly. In fact, we are pleased that

so many of the high school programs that we studied have successfully created placement programs or have brought in faculty with related work experience.

4. How much interest do students show in attending magnet schools? Here the answer would seem to be "a surprisingly large amount of interest." Eighty-one percent of the students applied to magnet schools in 1988, only one year after the lottery admission system began. An earlier report (Crain et al., 1992) found that the typical student applied to five magnet schools.

5. Are students interested in magnet schools which integrate academic and career education? Here the news is not as encouraging as we would hope. Over half of the students' first choices were academic magnet schools, nor were these choices solely by those students with relatively high reading test scores, who might prefer an undiluted college preparatory program. Nearly half of the first choices of the students in the middle and low reading achievement groups were also academic programs. This strongly suggests that many students are not convinced of the opportunities that career-oriented programs offer, that many students expect to attend college (realistically or not), and that the high level of participation in magnet schools may be partly an effort on the part of students to escape from undesirable or unsafe neighborhood comprehensive schools. If this is the case, then the magnet school is not yet meeting its objective of offering the students attractive alternative curricula from which they will make sensible choices. Rather, there may be to some extent a status game, where as many students as possible try to escape from the schools in the "worst" neighborhoods. This is not a bad thing, but it does mean that the magnet schools are not achieving their goal of encouraging students to choose schools based on their career interests.

6. While we are concerned that many students with average and low reading scores are *not* choosing career-oriented programs, it is also true that the present demand exceeds supply. Despite New York's great effort to create new programs, there are twice as many applicants as seats in vocational programs, and fifty percent more applicants than seats in programs for business and medical careers.

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APPENDIX
QUESTIONNAIRE FOR EDUCATIONAL OPTIONS PROGRAM ADMINISTRATORS

Hello Mr./Ms. _____. My name is _____ and I'm a researcher at Teachers College, Columbia University. We're doing a large federally funded study of EdOps in New York City, and we need to know some information about the _____ program. We only need approximate answers and we won't mention your program in our report. This should take only about fifteen to twenty minutes. First, I will ask you some specific questions that only require short answers. Then I will ask you for some general comments about the key features of your program. Some of the questions ask you to answer separately about each grade; all other times, your answers should be geared to your entire program. **(If breakoff, record suggested callback time on appointment sheet.)**

(Note: The items in italics should not be read in the case of total EdOp schools with only one program.)

1. First, some schools focus on college preparation, some focus on college preparation geared toward particular careers, and some focus on career preparation. Which one of these best describes your program: college preparatory, college preparatory with an emphasis on a career in _____, or career preparatory?

College preparatory	1
College prep with career focus	2
Career preparatory	3

2. Does your program prepare students to work if they choose to upon graduation from high school in a career in _____?

Yes	1
No	2

3. In addition to the high school diploma, does your program offer any special certification, license, or diploma *that is not offered to the rest of the school*?

Yes	1
No	2

4. Think a moment about students in the _____ program. Do they usually take courses in separate classes only with students from their own program, or are they usually mixed in with students from the rest of the school?

Usually separate classes	1
Half one way/half the other	2
A few separate classes	3
Usually mixed in	4

5. Do students in the _____ program take any special classes which students in the rest of the school usually do not take?

Yes, take special courses	1	(Go to 5a)
No, classes same as rest of school	2	(Go to 6)

5a. Now, answering separately for each grade, approximately how many special classes like this would a student take in each grade. Please indicate whether these are semester-long or yearlong classes.

	Semester	Year
5a12. in 12th grade?	_____	_____
5a11. in 11th grade?	_____	_____
5a10. in 10th grade?	_____	_____
5a9. in 9th grade?	_____	_____

6. Do students in your program use computers either in their classes or in a computer lab?

Yes	1	(Go to 6a)
No	2	(Go to 7)

6a. Approximately how many computers are available for the students in your program to use in the classes and/or computer lab?

Number _____

6b. In a typical week, would you say that *most* of your students will do some work using computers, or *not most*?

Yes, most use	1
No, most don't use	2

6c. Now, answering separately for each grade, how many hours per week would the typical student use the computers?

6c12. in 12th grade?	_____ hours
6c11. in 11th grade?	_____ hours
6c10. in 10th grade?	_____ hours
6c9. in 9th grade?	_____ hours

6d. Does your program use computers more, less, or equally as much as the rest of the school?

More	1
Equally	2
Less	3

7. A few programs have some sort of specialized equipment specifically intended for a particular career. Do your students use anything like that in their classes, other than computers?

Yes, use specialized equipment	1	(Go to 7a)
No, no specialized equipment	2	(Go to 8)

7a. In a typical week, would you say that most of your students will do some work using specialized equipment, or not most?

Yes, most use	1
No, most don't use	2

7b. Answering separately for each grade, how many hours per week would the typical student use specialized equipment other than computers?

7b12. in 12th grade? _____ hours
7b11. in 11th grade? _____ hours
7b10. in 10th grade? _____ hours
7b9. in 9th grade? _____ hours

8a. Answering for each grade separately, in a typical week, how many students are working on either independent or team projects? Would you say none, only a few, one-quarter, one-half, three-quarters, or nearly all?

	8a12. in 12th?	8a11. in 11th?	8a10. in 10th?	8a9. in 9th?
None	0	0	0	0
Only a few	1	1	1	1
one-quarter	2	2	2	2
one-half	3	3	3	3
three-quarters	4	4	4	4
Nearly all	5	5	5	5

(If all "none" go to 9, else go to 8b.)

8b. Answering for each grade separately again, how many hours per week would a typical student work on an independent or team project?

8b12. in 12th grade? _____ hours
8b11. in 11th grade? _____ hours
8b10. in 10th grade? _____ hours
8b9. in 9th grade? _____ hours

8c. Overall, is the project work in your program made up of mostly personal, independent projects or mostly cooperative, team projects?

Mostly independent projects	1
About the same	2
Mostly team projects	3

9. Do the students in your program do any sort of internships or part-time work assignments?

Yes	1	(Go to 9a)
No	2	(Go to 10)

9a. Answering separately for each grade, what proportion of the students in your program do an internship or part-time work assignment?

	9a12. in 12th?	9a11. in 11th?	9a10. in 10th?	9a9. in 9th?
None	0	0	0	0
Only a few	1	1	1	1
one-quarter	2	2	2	2
one-half	3	3	3	3
three-quarters	4	4	4	4
Nearly all	5	5	5	5

9b. Are internships or part-time work assignments part of the program requirements or are they optional?

Program requirement	1
Optional	2

9c. Do the students *mostly* find their own internships, or does the school staff find them?

Students find	1
Half and half	2
School staff finds	3

10. Does your program help locate employment for students graduating from the program?

Yes	1	(Go to 10a)
No	2	(Go to 11)

10a. Approximately how many program graduates are actually placed in employment located by your program?

Number _____

10b. How many students graduate from your program per year?

Number _____

11. Some schools offer activities or opportunities for students to learn about careers outside of their classes or work experiences. For each of the following items, answer whether or not the students in your program participate in such activities.

	YES	NO	(If Yes) How Many
11a. Trips to worksites?	1	2	
11a1. # trips per year	Number _____		
11b. Lectures from outside speakers from the _____ field?	1	2	
11b1. # lectures per year	Number _____		
11c. A formal mentoring system that matches students with professionals participating in the _____ field who meet with student regularly?	1	2	
11c1. # students	Number _____		
11d. Workshops on résumé writing or interview skills?	1	2	
11d1. # workshops per year	Number _____		
11e. Career-related clubs?	1	2	
11e1. # students in clubs	Number _____		

12. How many counselors are available to the students in your program? These may include any school counselors or program counselors that advise your students.
Number _____

12a. What is the average caseload assigned to each counselor?
Number _____

12b. Of the total number of counselors that serve the students in your program, how many offer *only career* advisement, how many offer *only academic* advisement, and how many do *both*?

12b1. Only career _____

12b2. Only academic _____

12b3. Both career/academic _____ (If both = 0, go to 12d)

12c. Do these counselors that offer *both* generally provide *more career* advisement or *more academic* advisement?

More career advisement	1
About the same	2
More academic advisement	3

12d. Does your program have its own counselor(s), or does it share its counselor(s) with the rest of the school?

Program counselor(s)	1
Both program/shared counselors	2
Share school counselors	3

13. Some programs have instructors who have experience working in the field in which they teach. Do the instructors in your program have any such experience working in the _____ field?

Yes	1	(Go to 13a)
No	2	(Go to 14)

13a. Would you say that most, half, or a few of the instructors in your program have such experience?

Most	1
Half	2
Few	3

14. What do you think are the most important aspects of your program?

15. What changes do you think would most improve your program?

Thank you very much. Your answers will be very helpful to us. The school board will release at least one research report on this project and we will see to it that one is sent to your school.

Your responses will be treated with complete confidentiality and your school will not be mentioned in our report. Is there anything else about your program which you think would be especially important for us to know when we do our report?

We will need a written consent form to comply with Federal Human Subjects regulations, so we will send you a postcard for you to sign and return, indicating that you voluntarily agreed to talk with us. Incidentally, let me repeat that we will not mention your name or program in our report. Thanks, again. Goodbye.

Date _____

Interviewer _____